



## CASE STUDY

# Traceability Solution Brings Security, Visibility, and Safety to Bahrain's Pharmaceutical Supply Chain

A Nation Realizes Its Healthcare Vision with Advanced Track and Trace Technology



## Customer

National Health Regulatory  
Authority, Kingdom of Bahrain



## Industry

Pharmaceutical Supply Chain,  
National Health Regulation



## Solution

LSPedia's OneScan

## Outcomes

**150+**

participants registered and reporting shipments  
through EPCIS in three months

**70M**

medicines tracked and traced using GS1  
standards and barcoding

**5,271**

approved GTINs loaded

**2,314**

shipment events successfully received

**1,582**

EPCIS file errors resolved

**126**

unauthorized companies identified and  
eliminated from master data

## Summary

To meet an ambitious national mandate, Bahrain's healthcare regulatory authority needed to upgrade the country's outdated pharmaceutical supply chain. After an initial attempt failed to meet its goals, the agency partnered with LSPedia, leveraging its services and OneScan solution to meet regulatory requirements, enhance supply chain security and visibility, and establish a long-term healthcare vision for the country and its citizens.



# Drug Safety and Authenticity Spark Urgent Changes in Bahrain's Pharmaceutical Supply Chain

The Kingdom of Bahrain, an island nation in the Persian Gulf, provides healthcare services to its more than 1.5 million residents through three bodies: the Supreme Council of Health (SCH), which sets priorities and strategies; the National Health Regulatory Authority (NHRA), a compliance agency; and the Ministry of Health (MOH), which manages services to the public.

In November 2017, the SCH issued a decree mandating that the NHRA apply a comprehensive track and trace system to the country's pharmaceutical supply chain. The goals of the project were ambitious, as well as vital to the country's healthcare goals: combat counterfeit medications, ensure product authenticity, and safeguard patient trust.

The NHRA began laying out a strategy and a timeline for success based on a core vision from the MOH:

- 1 Establish a unified IT system for medicine traceability.
- 2 Utilize industry standards (specifically GS1) for data collection and traceability.
- 3 Engage all supply chain takeholders to ensure reliable tracking.
- 4 Create a foundation for long-term, comprehensive drug tracking and regulatory adherence.

Shortly after launching the project, as Bahrain's regulatory requirements and program goals evolved, the NHRA's existing traceability solution was found wanting. Specifically, Bahrain's pre-LSPedia challenges included:

- **Inability to Achieve Comprehensive Traceability** with the previous system struggling to provide end-to-end visibility across the entire supply chain.
- **Messy, Low-Quality, and Missing Data** compromising the reliability of traceability efforts.
- **Lack of a Supplier Notification System for EPCIS File Processing Failures**, resulting in lost medicines going untracked and in-country suppliers waiting for shipments that never arrived.
- **Slow or Inefficient Manufacturer Onboarding** and failure to integrate serialization data, hindering widespread participation.
- **Vulnerability to Counterfeits** due to deficiencies within the system, introducing risk to patients.
- **Negative Impacts on Patient Safety and Public Trust**, rooted in the NHRA's inability to ensure product authenticity.
- **Financial and Intellectual Property Risks**, caused by fraudulent products in the market.

These systemic issues severely impacted Bahrain's ability to enforce regulatory compliance, ensure public health, and maintain the integrity of its pharmaceutical supply chain. In October, the original system stopped functioning entirely, forcing the NHRA into decisive action.

# A New Partner Puts NHRA On the Right Track

After understanding the deficiencies of their existing system, Bahrain chose to partner with LSPedia to develop and implement their comprehensive track and trace solution, OneScan, in a multi-phased approach. MVC, a company specializing in blockchain technology for linking financial data to product movement, was brought on to ensure the system's robustness and scalability.

## Key Milestones and Implementation Timeline

### 2018

NHRA published its first labeling and barcoding standards, emphasizing GS1, and launched GS1 BrandSync UAE for product and manufacturer information capture.

### 2020 - 2023

Basic medicine traceability tenets were implemented alongside advancements in in-country tracking. MVC's blockchain-enabled system began to capture supplier registration and shipment activity to Bahrain.

### 2024

Following the failure of the initial solution, LSPedia introduced advanced traceability and reporting capabilities, leveraging cutting-edge LSPedia technology and continued strategic partnership with MVC.

### OCTOBER - EARLY DECEMBER 2024 (CURRENT STATE)

In just three short months, the advanced system achieved remarkable adoption, driven by LSPedia's superior technical support, expertise in GS1 standards, seamless partner data connections, and agile onboarding techniques. **More than 150 manufacturing participants** onboarded in record-breaking time.

A critical challenge during this rapid transition was the migration of data connections from the previous solution provider to OneScan. LSPedia's VP of Industry Relations spearheaded efforts across the solution provider landscape, personally inviting them to test and certify with LSPedia. This collaborative approach ensured that their customers could transition to the new system with no downtime, demonstrating LSPedia's unique ability to work across the industry. These collaborative efforts were executed in a way that was non-disruptive to pharmaceutical suppliers and allowed for a streamlined onboarding process, demonstrating LSPedia's ability to collaborate even with competitors for the client's benefit.



# Solving Complex Challenges With a Full Suite of Track and Trace Capabilities

The deployed system now provides end-to-end traceability, directly supporting the SCH's vision. Its core features include:

## Standardized End-to-End Tracking and Reporting

The system utilizes industry-standard EPCIS 1.2 records for reporting shipments and receipts. Combined with comprehensive tracking and reporting based on universal GS1 labels and barcodes, the system ensures global interoperability and visibility across the entire supply chain.

## Centralized Data Hub

The NHRA-MVC Traceability Hub, powered by LSPedia's technology, acts as a central nervous system. All manufacturers, importers, and distributors must report complete serialization and aggregation data to this system.

## Automated Data Validation and Notification

The LSPedia Investigator tool automatically flags EPCIS files that do not meet standards and immediately notifies the supplier of the specific issues that need to be resolved, unlike the previous system.

## Comprehensive Inventory Visibility and Compliance Monitoring

LSPedia's system provides robust capabilities for system usage oversight and controlled substance protocols, alongside precise tracking of medicine quantities and locations throughout the supply chain.



# Measurable Improvements in Bahrain's Pharma Supply Chain

The LSPedia and MVC solution delivered transformative benefits across Bahrain's pharmaceutical supply chain, as demonstrated by the following key outcomes and metrics:

## Rapid Supplier Onboarding

**150+**

manufacturing participants successfully registered and actively reporting shipments through EPCIS 1.2 standards in just three months

## Scaled Traceability

**70M**

total medicines tracked and traced using GS1 standards and barcoding

**5,271**

approved GTINs loaded

## Enhanced Data Quality & Compliance

**2,314**

shipment events (EPCIS) successfully received, error free

**1,582**

EPCIS file errors resolved by manufacturers through Investigator

**126**

unauthorized companies identified and eliminated from master data

**909**

shipments containing non-approved products identified through Investigator

**358**

shipments with non-existent ship-to locations identified through Investigator

In addition to the above outcomes, the system also improves conditions for:

## Enhanced Patient Safety

The system rigorously verifies data against inventory, significantly increasing patient safety by detecting and stopping counterfeit medicines.

## Operational Efficiency

In-country vendors now receive comprehensive shipment data from a single scan for full shipments or by pallet.

## Global Compliance

The system meets global track and trace requirements and adheres strictly to GS1 standards.

## In-country buyers

Streamlined "One Scan" receive capabilities, exceptions management, visibility of missing and stolen medicines, activity reporting, and supplier compliance reports.

## Suppliers

Automated error checking of EPCIS files, email alerts, and clear visibility into file success and failure.

## Dispensers

Simplified "One Scan" receiving, robust exception handling, visibility of missing/stolen medicines, on-screen validation of scanned products, and access to supplier compliance reports.



## Sustaining Improvements for a Safer, More Efficient Future

The improvements are sustained by the system's current operational state and its foundational design. With over 150 manufacturers registered and enabled to report using industry standards (EPCIS 1.2, GS1 barcodes, aggregation data), the system provides real-time visibility and supports ongoing compliance.

LSPedia's technology, combined with MVC's blockchain expertise, provides a resilient and transparent track and trace framework. The agile onboarding techniques and ongoing technical support ensure new participants integrate efficiently, maintaining the system's comprehensive coverage and effectiveness over time. The solution is designed to be adaptable to evolving complexities in the global pharmaceutical supply chain.

---

## LSPedia Sets the Global Standard in Pharmaceutical Track and Trace Regimes

This project sets a new global benchmark for pharmaceutical supply chain security and visibility. The strategic partnership with MVC, which integrates blockchain capabilities, combines robust traceability with the ability to link financial data to product movement, offering an unparalleled level of transparency and security.

This success story underscores LSPedia's capability to deliver comprehensive, high-impact government solutions that drive both compliance and operational excellence on a national scale, making it a precedent and model for other nations seeking to secure their pharmaceutical supply chains.

# Start your pharmaceutical supply chain transformation today!

Reach out now to learn how we can help you streamline compliance, traceability, and operations.

GET IN TOUCH →



## About LSPedia

As a pioneering SaaS provider founded in 2013, LSPedia has become a global leader in pharmaceutical traceability and turnkey DSCSA compliance solutions. The company has achieved significant recognition for its rapid growth and industry impact, earning a coveted spot on the 2023 Inc. 5000 list of fastest-growing private companies in America. A testament to its innovation and excellence, LSPedia was also named to the Inc. 2024 Best in Business list in the Software-as-a-Service category.